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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/489,356	01/21/2000	Hong Shih	AM-1622.D1	5730

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APPLIED MATERIALS, INC.
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SANTA CLARA, CA 95050

EXAMINER

ZERVIGON, RUDY

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 11/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

09/489,356

Applicant(s)

SHIH ET AL.

Examiner

Rudy Zervigon

Art Unit

1763

-- The MAILING DATE of this c mmunicati n appears on the c ver sheet with the correspondence address --

Period f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,8-23 and 28-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,8-16,18-23,28,32 and 33 is/are rejected.
- 7) ☒ Claim(s) 17 and 29-31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 32 and 33 recites the limitation "said boundary", "said first portion", and "said second portion in claim 32. There is insufficient antecedent basis for this limitation in the claim.
3. Claim 32 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant stated "a third portion", yet does not provide a first or second portion in claim 13 from which claim 32 depends.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 3, 8-13, 15-16, 18-23, 28, 32, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quartarone (USPat. 5,104,514) in view of J.Linke et al ("Behavior of boron-doped graphites, plasma-sprayed B₄C, and a-C/B:H as plasma-facing materials"). Quartarone teaches coating aluminum-based substrates (abstract). Specifically, Quartarone teaches:

- i. Roughing a surface of a substrate to a value of surface finish Ra of at least 2.5 μ m – claims 1(a), 8(a) "400-700microinches RMS" = 10.161-17.78 μ m RMS
- ii. Anodizing the roughed surface - claims 1(b), 8(b)
- iii. Coating the roughed and anodized surface with a "protective material" by "plasma spraying a ceramic material" (PECVD) - claims 1(c), 7

Quartarone does not teach that the protective coating of the roughened and anodized surface is boron carbide. Linke et al teaches protecting plasma facing surfaces of plasma confining chambers by applying plasma CVD and plasma sprayed B₄C grains (boron carbide; "Materials and Characterization", paragraphs 3-5; "Erosion Behavior", entire section). Specifically, J. Linke et al teaches:

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- i. A method of coating boron carbide, as B_4C grains between B_4C and $B_{13}C_3$, (CVD, "Materials and Characterization", paragraphs 3-5; "B/C ratios" - first sentence; "low-pressure plasma spray" - 6th paragraph, left column, page 228) on a stainless steel and other substrates ("Materials and Characterization", paragraph 4; "Inconel 600")
- ii. Forming a boron carbide layer upon the surface ("Materials and Characterization", paragraphs 3-5)
- iii. The boron carbide layer of 25wt% of carbon relative to boron as represented by B_4C ("Materials and Characterization", paragraph 3)

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Quartarone to use J.Linke et al's plasma sprayed boron carbide as Quartarone's "coated protective material" (claims 1(c), 8(c)).

Motivation for Quartarone to use J.Linke et al's plasma sprayed boron carbide as Quartarone's "coated protective material" (claims 1(c), 8(c)) is drawn to J.Linke's motivation to provide a material that resists chemical erosion and provides reduced contaminants which improves the plasma performance of plasma-facing components ("Impurity Production of a Boronized Wall").

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6. Claims 2 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quartarone (USPat. 5,104,514) in view of Applicant's own admitted prior art to J.Linke et al as applied to claims 1, 3, 8-13, 15-16, 18-23, 28, 32, and 33 above, and further in view of Kizawa (JP 63-203098). The teachings of both Quartarone and J.Linke are discussed above. However, both Quartarone and J.Linke do not teach thermal spraying of the boron carbide film.

Kizawa teaches a thermal spraying material (2, Abstract) of boron carbide on aluminum members.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize Kizawa's thermal spraying material of boron carbide.

Motivation for utilizing Kizawa's thermal spraying material of boron carbide on aluminum members is for an alternative and equivalent method of applying boron carbide film.

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Allowable Subject Matter

7. Claims 17, and 29-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

None of the references of record teach the additional step of removing a portion of the anodized layer at a predetermined boundary.

Response to Arguments

9. Applicant's arguments with respect to claims 1-3, 8-23, and 28-30 have been considered but are moot in view of the new grounds of rejection.

13	→ A, D	13	AD
16	R, A, D	31	A, R, D
17			
30			

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPat. 5,858,122; 5,775,977; 5,714,243; 5,141,656; 5,838,530; 5,149,386; 3,929,591; 3,935,080; 3,988,217; 3,980,539; 5,156,720; 4,794,044; 5,635,254.

10. Applicant's amendment necessitated the new ground of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner

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can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.

A handwritten signature in black ink, appearing to read "Jeffrie R. Lund". The signature is written in a cursive, flowing style with a large initial "J" and "R".

**JEFFRIE R. LUND
PRIMARY EXAMINER**